



Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

Weekly Report - Snowpack / Drought Monitor Update

Date: 14 April 2011

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: SNOTEL Snow-Water Equivalent percent of normal values for 14 April 2011 shows 1-Category gains (blue circles) over much of the northern Interior West including Oregon. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circle) (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak shows continued gains across the West (excluding the Southwest). Most of the West is meeting or exceeding the long-term climatologically average snowpack. Melt-out is nearly completed over the Southwest (Fig. 1a). SNOTEL 7-day snow depth changes show significant late season gains over the parts of the Northern Rockies and most of Utah (Fig. 1b).

Temperature: Average SNOTEL temperatures were mainly 5°F to 10°F below the long term average for this time of year west of the Continental Divide and up to 5°F above normal east of the Divide (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across eastern New Mexico and Colorado (>+6°F) and the greatest negative departures over parts of the high country in California and western Arizona (<-10°F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 13 April shows the bulk of the heaviest precipitation confined to the Cascades, Wyoming Range, and northern Wasatch (Fig. 3). In terms of percent of normal, the precipitation was highest across the Interior West from Arizona to central Montana (Fig 3a). For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, most of Oregon, and parts of Northern and Central Rockies. One-category positive changes are denoted by the blue circles (Fig. 3b).

The Southwest: Rainfall deficits of up to 3 inches were observed over New Mexico, most of Arizona and eastern Colorado, and much of eastern Utah during the past month. Much of Arizona received up to 0.5 inches of precipitation in the past week, with locally greater amounts in north-central Arizona. The objective short-term and long-term blends depict the gradual degradation of conditions across the Southwest. SNOTEL basin-average Snow Water Content (SWC) dated April 11, 2011 indicates SWC values within the lowest 25 percent over all but extreme north-central New Mexico, and the southeastern half of Arizona. Water Year to Date (WYTD) Precipitation (April 12) is still running well below normal for most of New Mexico and Arizona since October 1st, 2010. WYTD precipitation is mostly near or slightly above normal over southwestern Colorado, and well above normal over northwestern Colorado, and northern and central Utah. No alterations were made to the drought depiction this week, but may be required next week pending further assessment by local experts.

North-central Rockies: WYTD precipitation in Wyoming is running near-above normal, as is snow water content. A localized 3-inch maximum of precipitation was observed in part of northwestern Wyoming during the last 7-days. For now, no changes were deemed necessary

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for the two D0(H) areas in western portions of the state. **Author:** [Anthony Artusa, NOAA/NWS/NCEP/CPC](#)

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

DROUGHT IMPACTS DEFINITIONS (<http://drought.unl.edu/dm/classify.htm>)

The possible impacts associated with **D4 (H, A)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (H, A)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (H, A)** drought are focused on water shortages common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with **D1 (H, A)** drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 and 4a).

SOIL MOISTURE

Soil moisture (Figs. 5a and 5b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). Another good resource can be found at: <http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

U.S. HISTORICAL STREAMFLOW

http://water.usgs.gov/cgi-bin/waterwatch?state=us&map_type=dryw&web_type=map.

This map, (Fig. 6) shows the 7-day average streamflow conditions in hydrologic units of the United States and Puerto Rico for the day of year. The colors represent 7-day average streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

STATE ACTIVITIES

State government drought activities can be tracked at the following URL: <http://drought.unl.edu/mitigate/mitigate.htm>. NRCS SS/WSF State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SS/WSF information - <http://www.wcc.nrcs.usda.gov/cgibin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/> and <http://drought.gov>.

FOR MORE INFORMATION

The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage - <http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ JEFF GOEBEL
Acting Director, Resource Inventory Division

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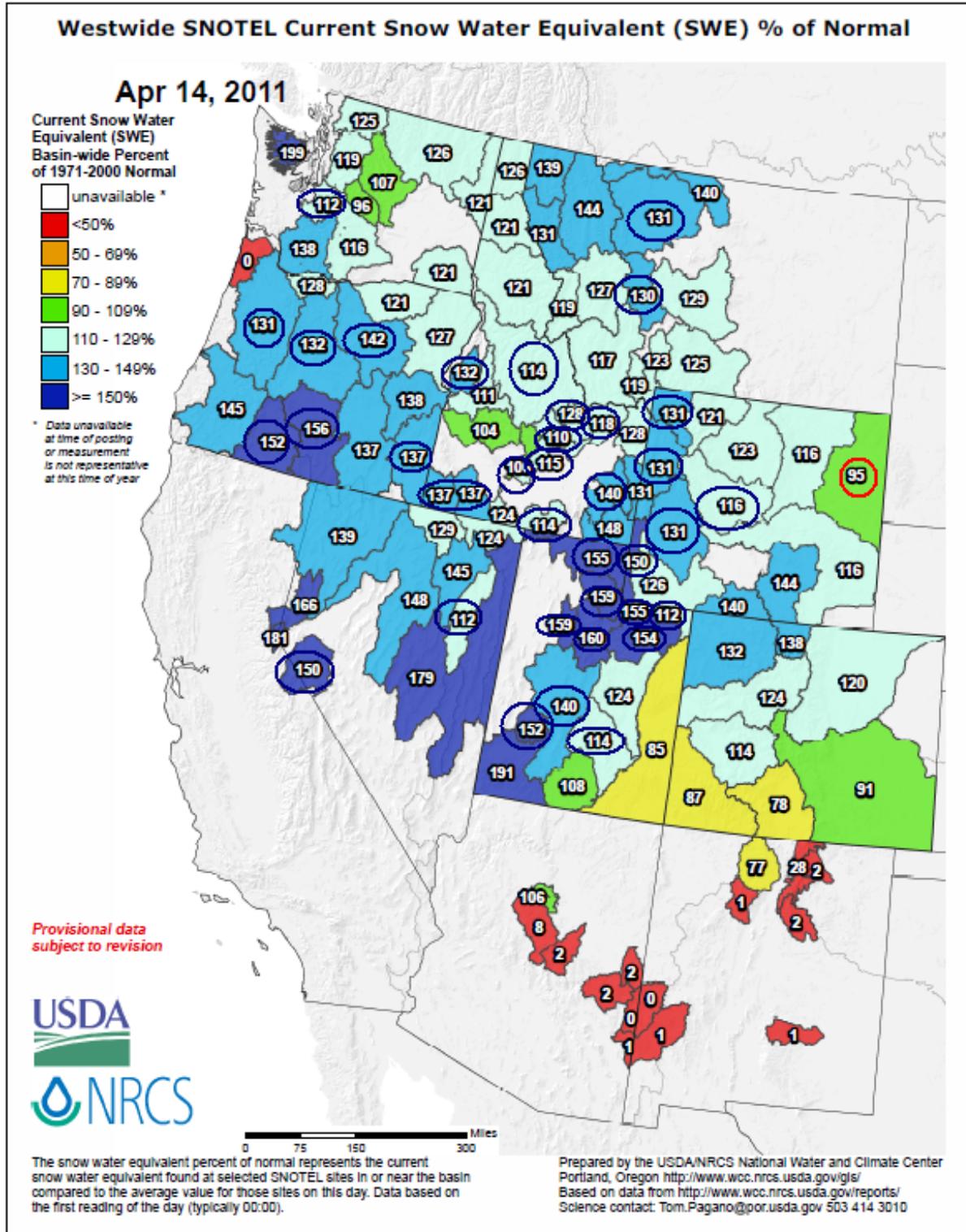


Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 14 April 2011 shows 1-Category gains (blue circles) over much of the northern Interior West including Oregon. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circle).

Ref: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

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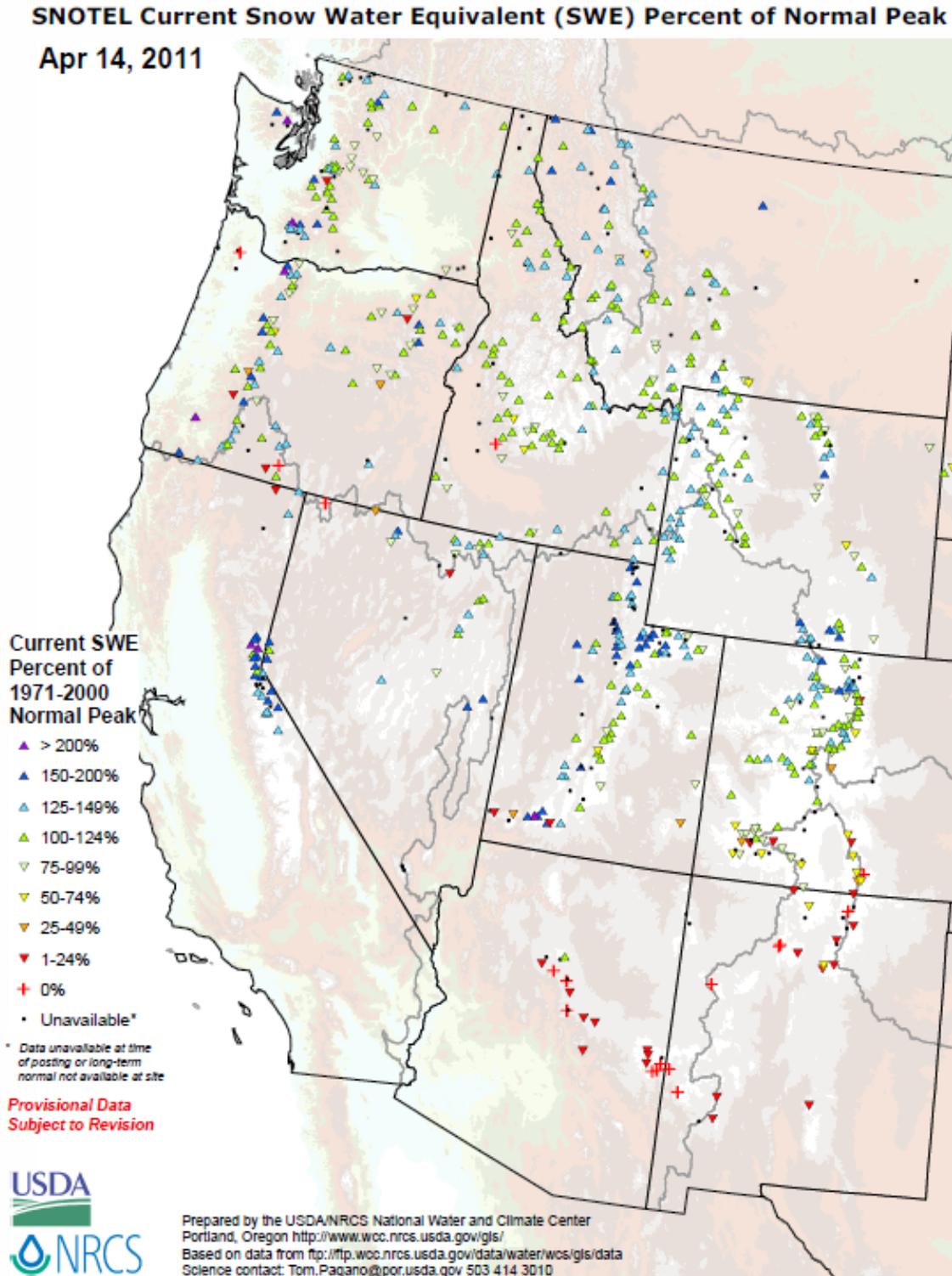


Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows continued gains across the West (excluding the Southwest). Most of the West is meeting or exceeding the long-term climatologically average snowpack with melt-out nearly completed over the Southwest.

Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideSWEPercentPeak.pdf>

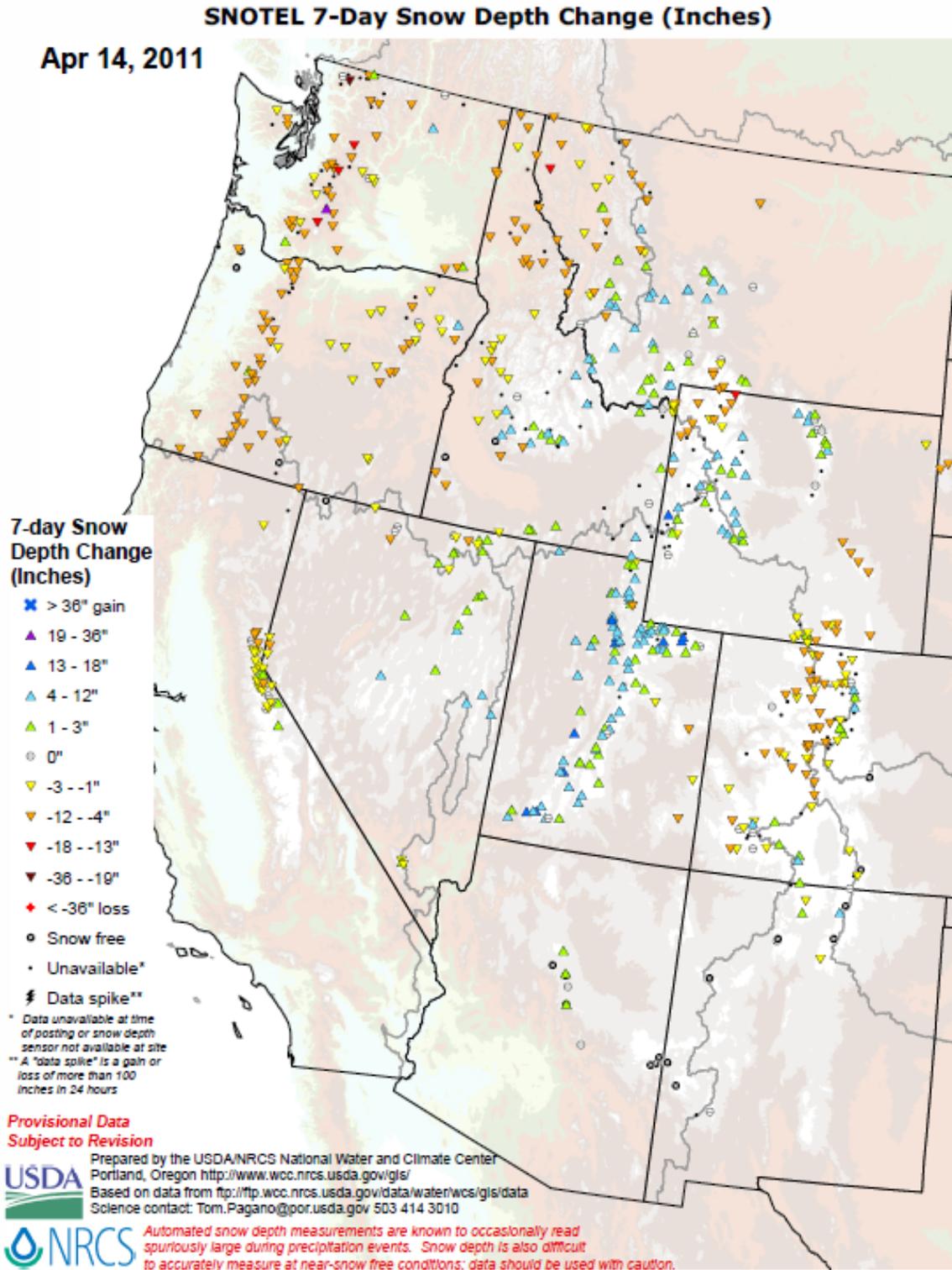


Fig. 1b: SNOTEL 7-day snow depth changes show significant late season gains over the parts of the Northern Rockies and most of Utah. Note: As the sun's influence on snow-melt increases, this map becomes of lesser value and will not be included in these weekly reports until next winter.

Ref: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf

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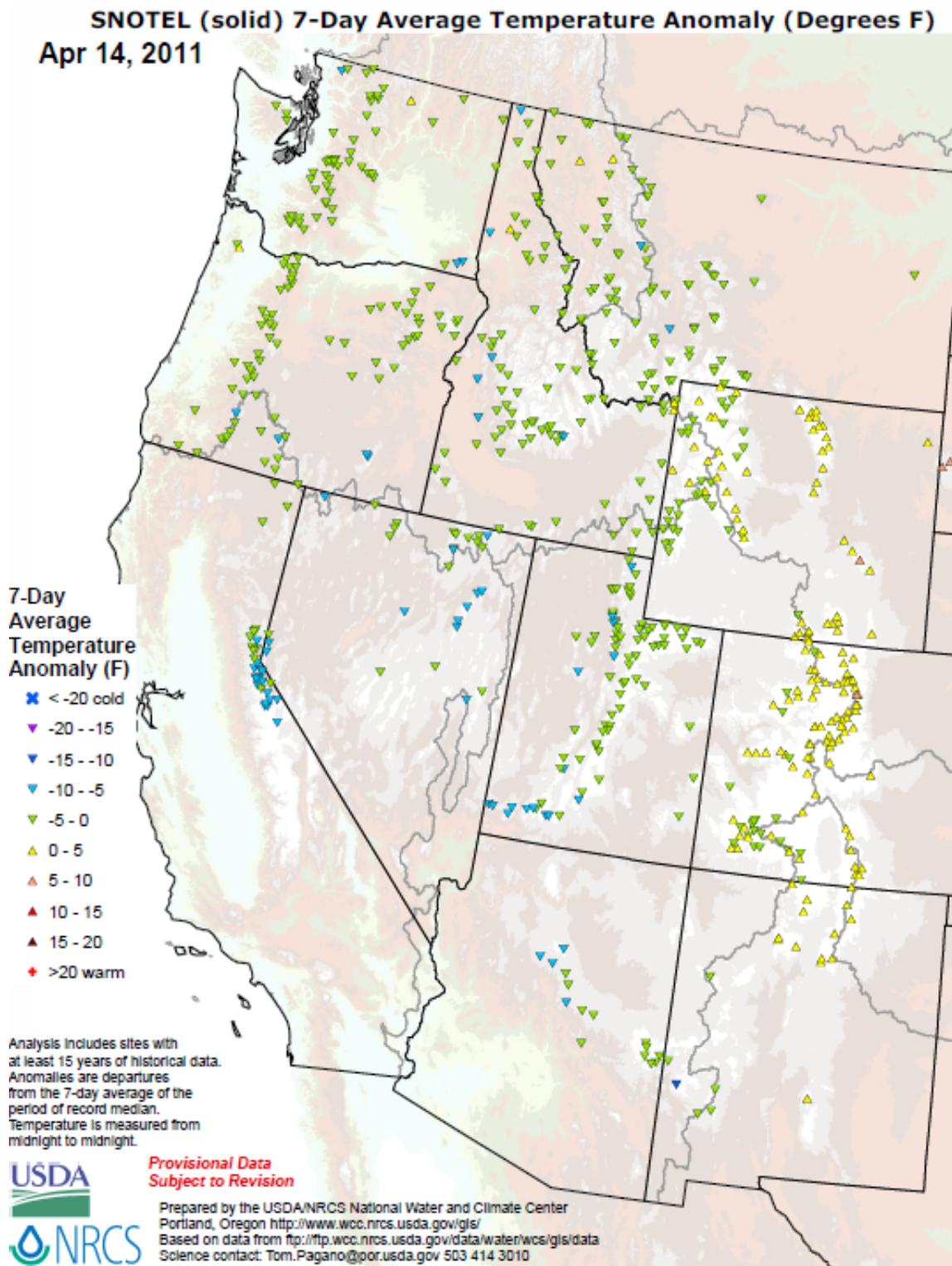
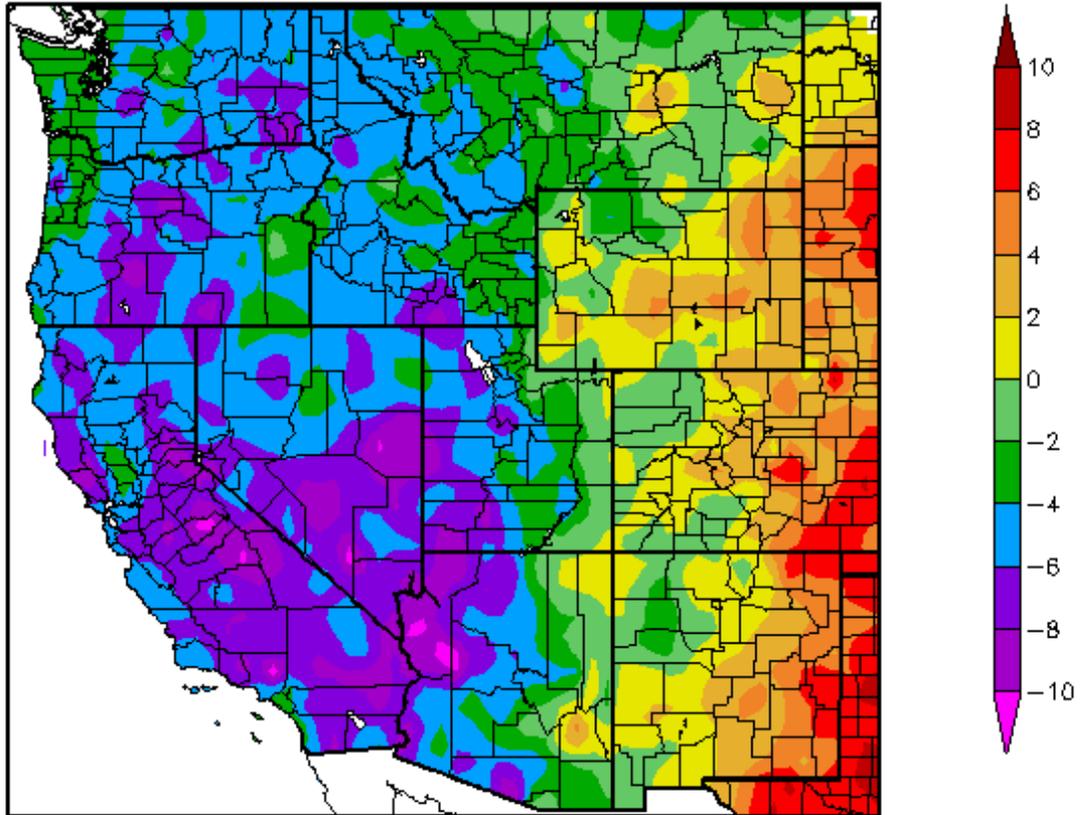


Fig. 2: Average SNOTEL temperatures were mainly 5°F to 10°F below the long term average for this time of year west of the Continental Divide and up to 5°F above normal east of the Divide.

Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

Departure from Normal Temperature (F)
4/7/2011 - 4/13/2011



Generated 4/14/2011 at HPRCC using provisional data.

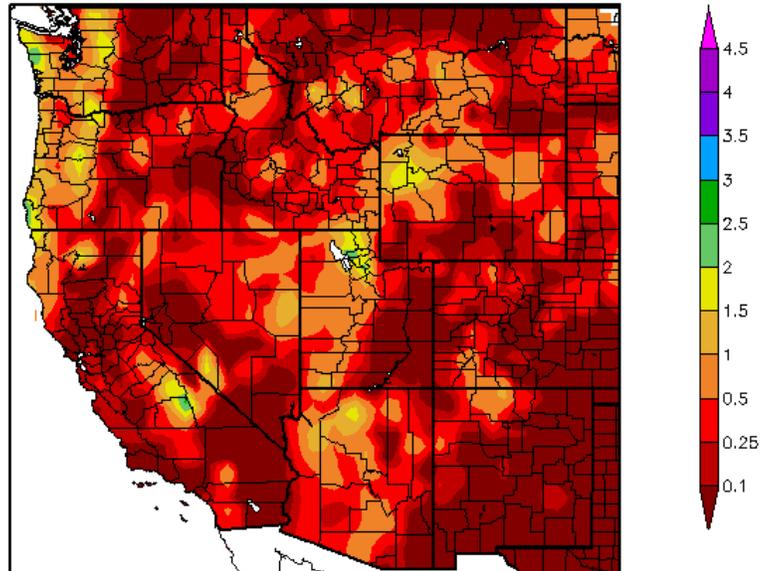
Regional Climate Centers

Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across eastern New Mexico and Colorado (>+6°F) and the greatest negative departures over parts of the high country in California and western Arizona (<-10°F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d

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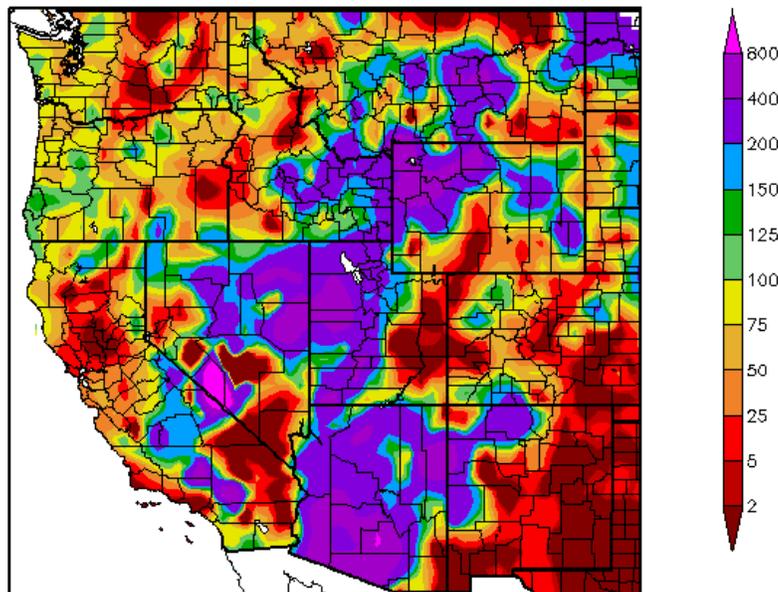
Precipitation (in)
4/7/2011 - 4/13/2011



Generated 4/14/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
4/7/2011 - 4/13/2011



Generated 4/14/2011 at HPRCC using provisional data.

Regional Climate Centers

Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 13 April shows the bulk of the heaviest precipitation confined to Cascades, Wyoming Range, and northern Wasatch (Fig. 3). In terms of percent of normal, the precipitation was highest across the Interior West from Arizona to central Montana (Fig 3a).

Ref: <http://www.hprcc.unl.edu/maps/current/>

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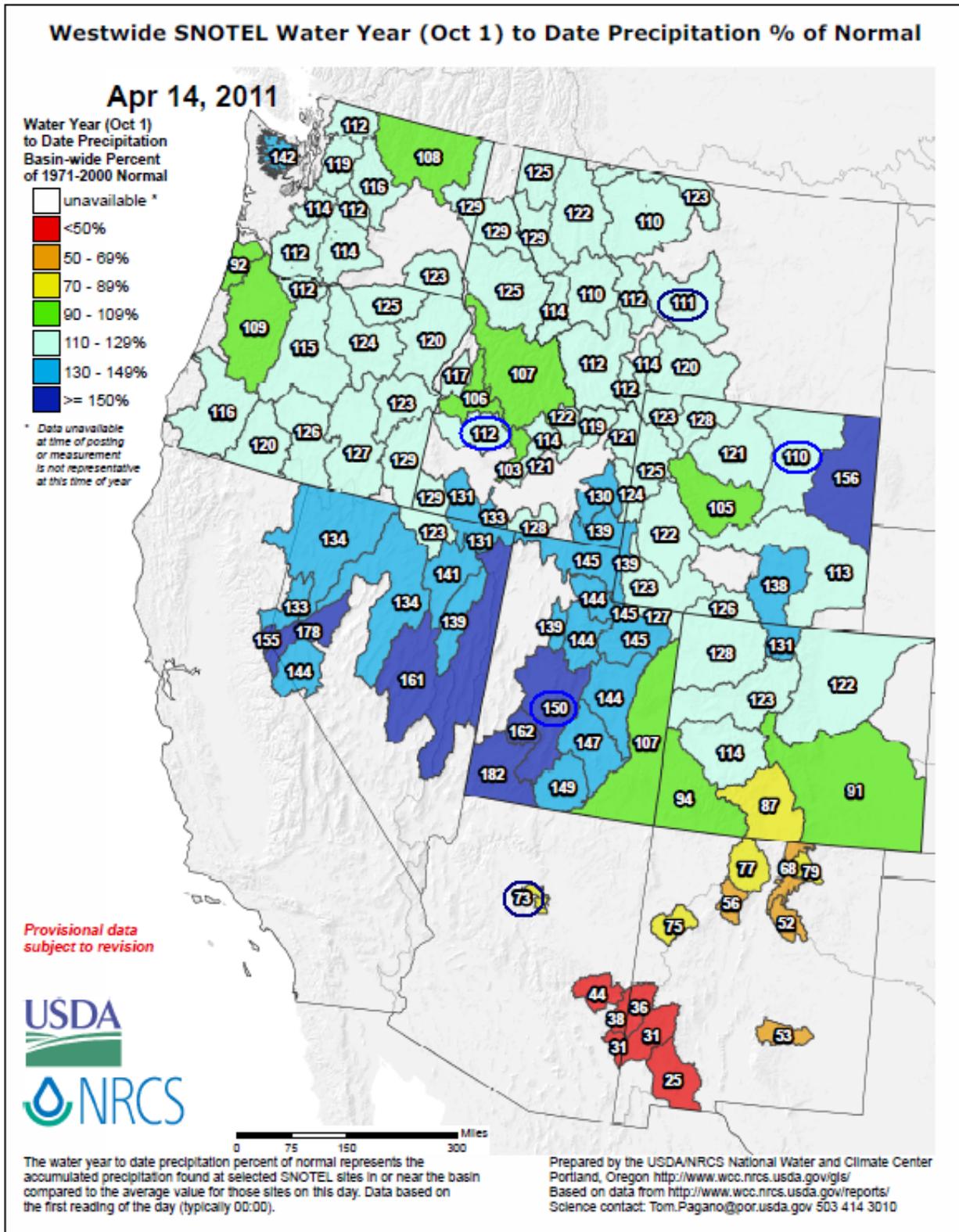
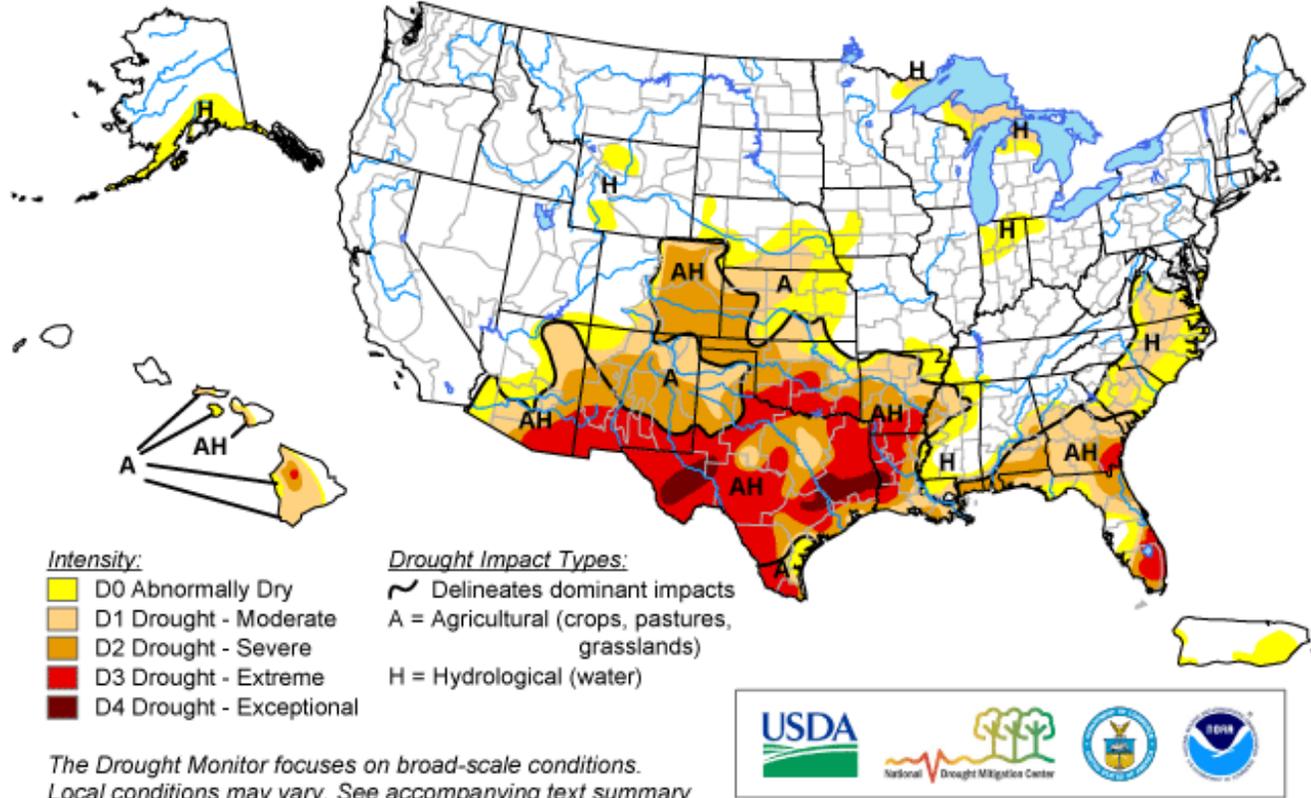


Fig 3b: For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, most of Oregon, and parts of Northern and Central Rockies. One-category positive changes are denoted by the blue circles.

Ref: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_wytdprecptnormal_update.pdf

U.S. Drought Monitor

April 12, 2011
Valid 8 a.m. EDT



Released Thursday, April 14, 2011
Author: Anthony Artusa, NOAA/NWS/NCEP/CPC

<http://drought.unl.edu/dm>

Fig. 4: Current Drought Monitor weekly summary. The exceptional D4 levels of drought are found over western and eastern Texas. Ref: <http://www.drought.unl.edu/dm/monitor.html>

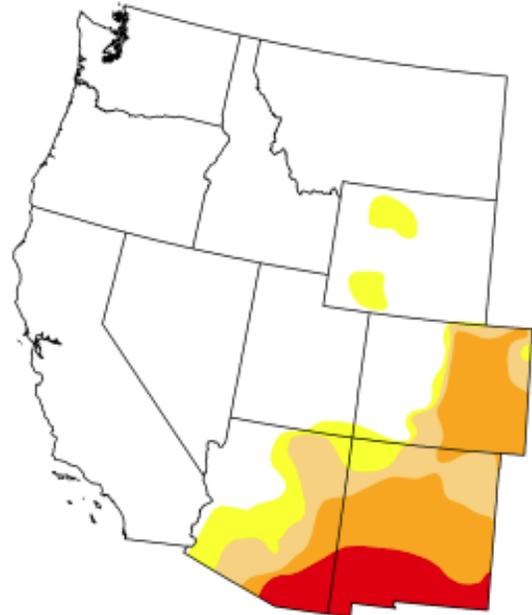
U.S. Drought Monitor

West

April 12, 2011
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	75.98	24.02	19.17	13.34	4.15	0.00
Last Week (04/05/2011 map)	76.09	23.91	19.18	13.39	4.16	0.00
3 Months Ago (01/11/2011 map)	76.92	23.08	11.88	0.89	0.00	0.00
Start of Calendar Year (12/28/2010 map)	73.26	26.74	11.98	0.89	0.00	0.00
Start of Water Year (09/28/2010 map)	62.50	37.50	8.14	0.56	0.00	0.00
One Year Ago (04/06/2010 map)	43.54	56.46	20.63	4.89	0.00	0.00



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



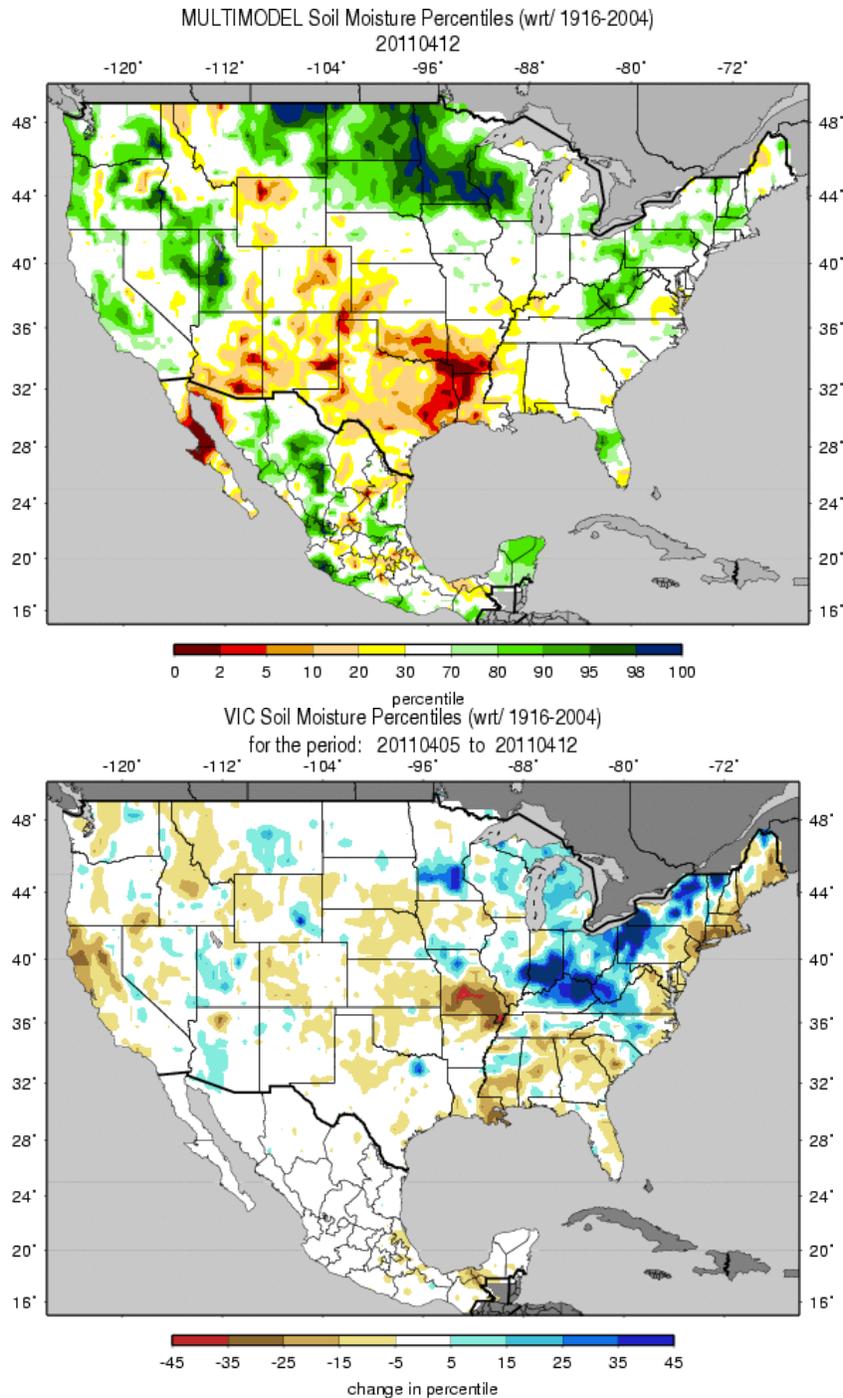
Released Thursday, April 14, 2011
Anthony Artusa, NOAA/NWS/NCEP/CPC

<http://drought.unl.edu/dm>

Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was little change during the past week.

Ref: http://www.drought.unl.edu/dm/DM_west.htm

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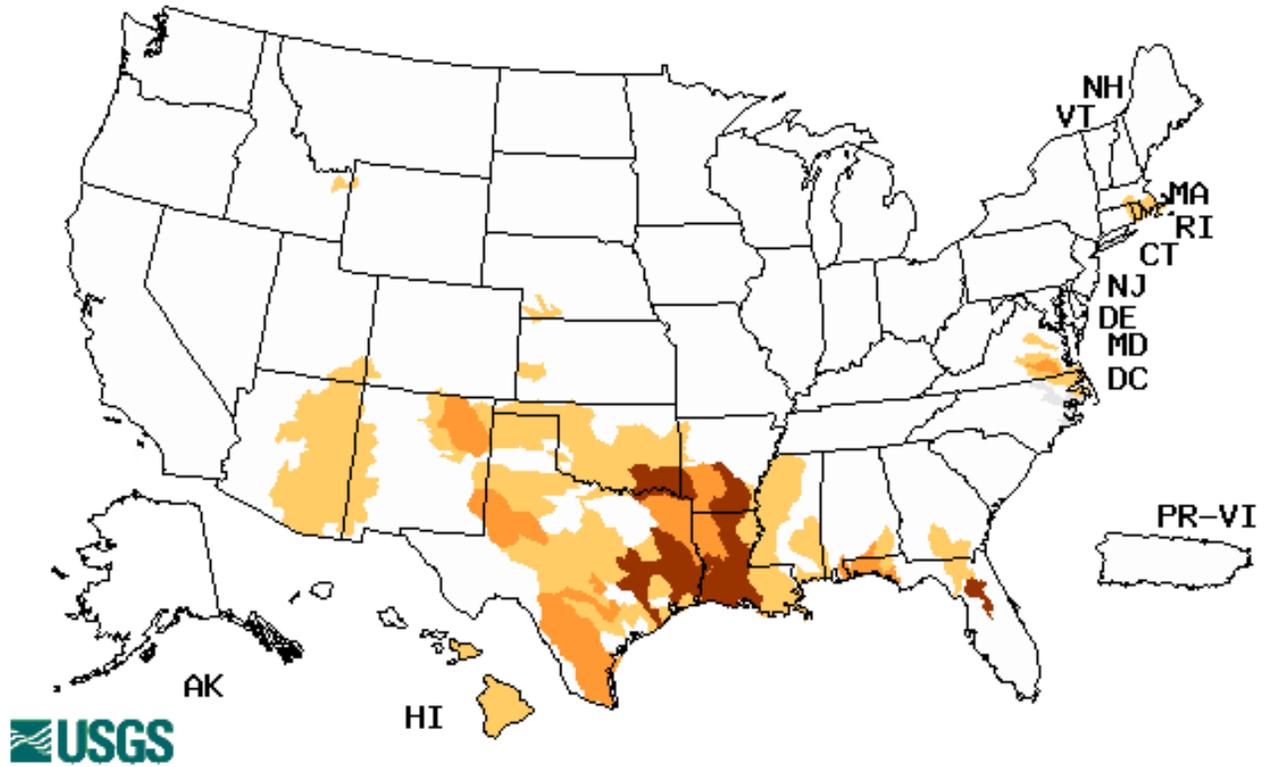


Figs. 5a and 5b: Soil Moisture ranking in percentile as of 12 April (Fig. 5) shows moist conditions over much of the Northern Tier States and Great Basin with dryness over Arizona and much of the Lower Mississippi River (top). For the past week, the Ohio Valley to Western New England has experienced significant increases while Arkansas, northern California, and eastern New England are drying out.

http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.multimodel.sm_gnt.gif
http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_gnt.1wk.gif

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Wednesday, April 13, 2011



Explanation - Percentile classes				
Low	≤5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Fig. 6: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Portions of the eastern Texas, Louisiana, Arkansas, central Florida, and southeast Oklahoma, are indicating severe conditions. Note: northern-most gauges are less accurate as rivers and streams are probably frozen.

Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

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National Drought Summary -- April 12, 2011

The discussion in the Looking Ahead section is simply a description of what the official national guidance from the National Weather Service (NWS) National Centers for Environmental Prediction is depicting for current areas of dryness and drought. The NWS forecast products utilized include the HPC 5-day QPF and 5-day Mean Temperature progs, the 6-10 Day Outlooks of Temperature and Precipitation Probability, and the 8-14 Day Outlooks of Temperature and Precipitation Probability, valid as of late Wednesday afternoon of the USDM release week. The NWS forecast web page used for this section is: <http://www.cpc.ncep.noaa.gov/products/forecasts/>.

Overview: Across the dryness and drought areas of the United States, the heaviest precipitation during the past week was mostly confined to parts of eastern Oklahoma, northern Arkansas, and northern Indiana. An active weather pattern persisted over the country with occasional frontal activity. Temperatures have been above normal east of the Continental Divide, with the greatest departures of 8-10 degrees F above normal over parts of the southern Plains and middle Mississippi Valley. West of the Divide, temperatures have generally been up to 4 degrees F below normal, with a few localized areas of 6-8 degree departures.

The Northeast and Mid-Atlantic: Observed rainfall during the past week has generally been on the light side (up to 0.5 inches) over the coastal plain, and on the heavy side (1.5-2.5 inches) over the higher elevations of the central Appalachians, Alleghenies and northern Adirondacks. Along with above to much-above normal stream flows, a slight eastward adjustment to the western margins of both abnormal dryness (D0) and moderate drought (D1) in western Virginia was deemed appropriate. In contrast, stream flows in and around Rhode Island are currently running much below normal (lowest ten percent of the historical stream flow distribution), and low stream flows have been recorded for at least the past month. Precipitation deficits of up to 3.0 inches have accumulated over the past 30-days, though current total column soil moisture anomaly values fall within the near-normal tercile (NLDAS).

Southeast: Rainfall deficits of 4-8 inches were observed in the January-March 2011 season across southeastern Virginia, central portions of North Carolina, southern portions of both Georgia and Alabama, and the western Florida panhandle. For the past 30-days, the most serious deficits (3-6 inches) have been over southern Alabama and adjacent parts of the Florida panhandle. Though the Carolinas were off to a very dry start early in 2011 which is consistent with La Nina winters, showers and thunderstorms in recent weeks have at least temporarily offset the severity of dryness and drought in the area. This is well indicated by the objective short-term and long-term blends, with hydrological impacts being dominant this early in the spring. Recent warmth and moisture have been favorable for small grains. In central North Carolina, the western margins of abnormally dry (D0) and moderate drought (D1) conditions were shifted slightly eastward, consistent with recently favorable rain across the higher terrain of western North Carolina. In South Carolina, farm operators were able to continue planting despite high winds and damaging hail in the past week, as the severe weather was sporadic and occurred primarily in the evenings. Statewide soil moisture was rated as 4 percent short, 81 percent adequate, and 15 percent surplus. In Georgia, statewide soil moisture was rated as 1 percent very short, 10 percent short, 79 percent adequate, and 10 percent surplus. Rainfall amounts across the state ranged from a trace up to near 2 inches locally in the past week. In southern Florida, continuing dryness prompted the expansion of extreme drought (D3) over all of northern Miami-Dade County, and the severe drought (D2) area was shifted southward

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across southern Miami-Dade County and Monroe County. According to local experts, Fort Lauderdale and West Palm Beach have experienced rainfall deficits of about 22 inches since June 1, 2010.

Delta: During the past week, moderate showers and thunderstorms (1-2.5 inches) fell over north-central Mississippi, and northwestern Arkansas. However, much less rain fell elsewhere, exacerbating regional drought conditions. This led to expanding the area of exceptional drought (D4) from eastern Texas into western Louisiana. This includes the Louisiana parishes of Vernon and northern Beauregard. In addition to wildfire impacts, there are also water conservation measures being implemented by the Sabine River Authority. Extreme drought (D3) was also extended slightly eastward in this week's drought depiction across central Louisiana. Local experts note that the Louisiana statewide average precipitation deficit is about 16 inches for the past 12 months, making this the 4th driest on record since 1895. The 180-day precipitation anomaly for the coastal section of Mississippi is a staggering 16 inches, warranting an expansion of (at least) D2 conditions from the Mobile, AL area westward to the eastern Louisiana border. Severe drought (D2) was also introduced to south-central Louisiana, and included southern St. Mary and lower St. Martin Parishes, as well as Terrebonne Parish. Stream flows across much of Louisiana and southern Arkansas are currently running well below normal.

Midwest: Light to moderate rain (up to 1 inch) fell across parts of upper Michigan, and northern lower Michigan during the past 7-days, with greater amounts (1-2 inches) observed over the abnormally dry (D0(H)) area over northern Indiana and extreme northwestern Ohio. Temperatures for the first 10 days of April 2011 have been averaging a few degrees above-normal, with the greatest anomalies (+7 F to +8 F) over the confluence area of the lower Ohio and middle Mississippi rivers. In Iowa, northwestern and west-central Illinois, slow green-up has been accelerated by the recent warmth, and the dryness has been beneficial for spring field work. A slight trimming back of abnormally dry (D0) conditions was made in southwestern Iowa, though D0 conditions did expand northward into west-central portions of the state. In southeastern Iowa, tributary stream flows continue to do well, and both topsoil and subsoil moisture is mostly adequate or surplus. Therefore, for the time being, no D0 has been introduced into southeastern Iowa.

Southern and Central Plains: During the past week, a band of 1-2 inch rains fell across southeastern portions of Oklahoma and northeastern portions of Texas. The southern lower Plains (and adjacent lower Mississippi Valley) have experienced very low stream flows for at least the past 30-days, and top 1-meter soil moisture anomalies in the past 30-days of at least 2 to 3 inches across a broad portion of the region, with some embedded areas of 3 to 5 inch deficits (NLDAS). USDA maps indicate 86 percent of Oklahoma and 90 percent of Texas are dominated by short-very short topsoil moisture conditions. Precipitation deficits in the southern lower Plains range from 3-6 inches in the past 30-days to 4-8 inches in the past 90-days. With deficits of 12-16 inches in the past 180-days, extreme drought (D3) conditions were expanded across McCurtain and Pushmataha Counties in southeastern Oklahoma, with severe drought (D2) extended slightly northward of these Counties. Local experts note that Latimer County continues to have extremely low farm ponds and a shortage of hay, and recommend maintaining D2 conditions here for the time being. Along the northern tier of Counties in Oklahoma, locally 1-3 inches of rain, baseball-sized hail, and winds in excess of 90 mph were noted in eastern Grant, Kay, and western Osage Counties. Therefore, a westward shift was made in the drought depiction of D0 conditions from eastern Osage County through Kay and eastern Grant Counties to indicate some improvement. In southeastern Texas, extreme drought (D3) was nudged southward into Wharton and Jackson Counties. In this region, crops are doing

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poorly, and reservoir levels are either holding steady or very slowly falling. In southwestern Texas, extreme drought (D3) was downgraded even further to exceptional drought (D4). Since the start of the current water year (Oct. 1), barely any rain has fallen. In Pecos County, Fort Stockton received only 0.01 inches, while in Jeff Davis County, Fort Davis had 0.09 inches. In Midland, 0.11 inches of precipitation has fallen, which is only two percent of normal! It is by far the driest such period on record for Midland, dating back to 1930. In addition, one wildfire between Marfa and Fort Davis consumed 108,000 acres since the weekend. Finally, in far southeastern South Dakota, the prevalence of recent dry conditions has proved beneficial to field preparation for planting.

The Southwest: Rainfall deficits of up to 3 inches were observed over New Mexico, most of Arizona and eastern Colorado, and much of eastern Utah during the past month. Much of Arizona received up to 0.5 inches of precipitation in the past week, with locally greater amounts in north-central Arizona. The objective short-term and long-term blends depict the gradual degradation of conditions across the Southwest. SNOTEL basin-average Snow Water Content (SWC) dated April 11, 2011 indicates SWC values within the lowest 25 percent over all but extreme north-central New Mexico, and the southeastern half of Arizona. Water Year to Date (WYTD) Precipitation (April 12) is still running well below normal for most of New Mexico and Arizona since October 1st, 2010. WYTD precipitation is mostly near or slightly above normal over southwestern Colorado, and well above normal over northwestern Colorado, and northern and central Utah. No alterations were made to the drought depiction this week, but may be required next week pending further assessment by local experts.

North-central Rockies: WYTD precipitation in Wyoming is running near-above normal, as is snow water content. A localized 3-inch maximum of precipitation was observed in part of northwestern Wyoming during the last 7-days. For now, no changes were deemed necessary for the two D0(H) areas in western portions of the state.

Hawaii, Alaska and Puerto Rico: During the past 30 days in Hawaii, precipitation at a few selected stations stood at 106 percent of normal at Honolulu, 71 percent of normal at Hilo, 11 percent of normal at Kaunakakai on the island of Molokai, and only 6 percent of normal at Kahului on the island of Maui. Vegetation conditions improved enough on Lanai despite some short-term dryness to warrant a 1-category upgrade from D1 to D0. In coastal southern Alaska, precipitation was widely scattered, with amounts ranging from little if any to 3 inches. Stream flow percentiles varied markedly across this same region. No alterations to the drought depiction were made for Alaska. In Puerto Rico, despite little precipitation, stream flows remained near normal. No changes were made to the drought depiction for Puerto Rico.

Looking Ahead: For the ensuing 5 days (through April 18), with few exceptions, prospects for heavy rain are greatest across areas that do not need the precipitation. The northern and eastern fringes of the large drought area centered over the south-central states may receive between 0.5 and 1.5 inches of rain (for example, southern Nebraska, northern Kansas, and much of both Arkansas and Mississippi). Near the Atlantic Seaboard, North Carolina is likely to receive additional, beneficial rainfall with over 0.75 inches in most areas, and up to 1.5 inches of rain is expected over Rhode Island, which will help reverse the current drying trend. Temperatures are forecast to be near to below normal over most areas of the CONUS, with the exception of above normal temperatures over the Southwest.

The CPC 6-10 day outlook (valid April 19-23) is calling for enhanced chances of above-median precipitation over most of the eastern half of the lower 48 states, and western Washington state,

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and enhanced chances of below-median precipitation over the Southwest, and southwestern Alaska. The temperature pattern for this period is expected to feature elevated odds of below normal temperatures over much of the northern CONUS and Alaska, and above normal temperatures over the southern and eastern CONUS.

Author: [Anthony Artusa, NOAA/NWS/NCEP/CPC](#)

Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated April 13, 2011